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shouldering the whole of its burden? Is even natural science, the professed exemplar of pragmatism, content with summarizing and describing? While we may admit, then, that some of Bergson's attempts to solve philosophical problems are not altogether happy, we must remember that he attacks a number of questions that James, apparently, leaves unconsidered.

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The Limitations of Science. By LOUIS TRENCHARD MORE. New York, Henry Holt and Company, 1915.—pp. 268.

This book is a popular discussion and criticism of some of the more 'metaphysical' parts of modern theoretical physics, in particular of the theory of relativity and the conceptions of matter, electricity, and the ether. The several chapters have all appeared as articles, four in the *Hibbert Journal* and one each in the *Philosophical Magazine*, the *Monist*, and the *Unpopular Review*, and though they are said in the Preface to have been rewritten to form a connected discussion, there is in fact much repetition and no very evident development from one chapter to the next. Each contains substantially the author's whole point, viz., that the legitimate function of science is limited to "the discovery of natural phenomena and their classification into general laws derived by logical mathematical processes" (p. 31).

Consequently the author regards all theories of the structure of matter, however formulated, as ontological and therefore extra-scientific. With a view to establishing this criticism he discusses Larmor's electro-magnetic theory of the ether, Lorentz's theory of electrons, Einstein's theory of relativity, and a variety of other hypotheses of similar tendency. The author argues that such entities as atoms, electrons, ether, and the like are purely imaginary and that the hypotheses which employ them are therefore not capable of empirical verification. They are, in fact, products of the creative imagination and are therefore quite as subjective as the other metaphysical substances which scientists have been accustomed to deride. The resulting theories of matter are at best wholly hypothetical; they are often almost, if not quite, incomprehensible; and they are very dangerous because they promote an uncritical attitude of mind among scientists. More serious than any of these, moreover, is the charge that these hypotheses are almost useless in promoting scientific investigation. In fact, the author undertakes to show (Chapter III) that all the enormous labor expended upon hypotheses about the structure of matter has scarcely taken their authors in principle beyond the point already reached by Descartes two and a half centuries ago, while experimentation and empirical investigation have gone their way and won their triumphs pretty much in independence of hypothetical construction (pp. 220 ff.).

This is undoubtedly the point at which the great mass of physicists will take issue with Professor More, and considering how vital this point is in his argument, there is surprisingly little in his book except assertion regarding it. He is quite right, of course, when he says that the mere co-existence of these hypotheses with fruitful investigation does not prove that the investigation arose from the hypotheses. But, on the other hand, how does Professor More propose to show that the course of investigation would have been much the same if a large part of the hypothetical work had been different or wholly absent? Nothing in modern logic is more thoroughly established than the dependence of empirical investigation, whether experiment or mere observation, upon hypothesis (using the term in a wide sense and without the bad connotation which Professor More gives it), and nothing but a thorough logical analysis of physical investigation can show that there is a recognizable type of hypothesis which can be excluded on logical grounds before the investigation begins.

The limitation of science, then, follows from a supposed distinction between causal explanation or hypothesis on the one hand and the classification of phenomena in laws on the other. The author does indeed admit that this distinction is not altogether clear, though he seems to believe that it can be made for practical purposes in scientific work; certainly it is clear that unless the scientist can recognize an hypothesis when he meets it, the book loses its point. It becomes merely an exhortation to be sober-minded and critical, one of the least useful forms of criticism, since no one will admit that he needs it. Some of Professor More's examples, however, scarcely inspire confidence in his ability to 'spot' a vicious hypothesis on sight, for instance, when he distinguishes Darwin's theory of evolution, as dealing only with sensible matter and being capable of a rigid test, from natural selection, as creating fictitious substances and attributes. Surely this criticism, if it can justify itself, is sharper than any two-edged sword, piercing even to the dividing asunder of the soul and spirit; the great difficulty is that Professor More does not tell how he does it.

Surely it is clear that any such distinction as Professor More proposes to make between fact, theory, and hypothesis, is a matter of degree; it is no strange experience in science to see theories unsettled which were thought to be secure or to see theories accepted which were thought to be discredited. A judgment of final scientific inutility is hazardous in the extreme, and moreover this tentative character in scientific statements is not confined to a single group of generalizations that can be discredited as metaphysical; every important scientific advance surely throws a new light on every department of the subject. The truth seems to be that, though Professor More speaks in the terms of an economical or instrumental logic, he has a strong bias toward a scientific absolute; one feels in his writing the bias toward finality and an impatience of the tentative. The only question he is willing to ask about a scientific hypothesis is, Is it true? And if it is, he seems to think that science ought to be able to say so and be done with it. But this supposed finality of facts and laws never gets beyond the stage of unexplained assumption. There are numerous references to direct experience and some even to 'instinct' and common sense, but there is no attempt to say what experiences are direct or what convictions are certified by instinct or common sense. Empirical verification is spoken of as if it were a simple and infallible test that could be applied without inferential interpretation. The necessity of assuming an objective world is insisted upon, as if there were a difference of opinion on the point or as if the method of science in some way were settled by it. And even innate ideas of space, time, and matter are suggested in a hesitating sort of way. But none of these suggestions is ever followed up and the supposed non-hypothetical basis of science remains quite shadowy. Such an uncriticised logical absolute is fundamentally at odds with the phenomenalism that Professor More professes.

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Modern Philosophers and Lectures on Bergson. By HARALD HÖFFDING. Translated by ALFRED C. MASON. London, Macmillan and Co., 1915.—pp. xii, 317.

This volume consists of lectures delivered at the University of Copenhagen during the autumn of 1902 and lectures on Bergson delivered in 1913. The first set of lectures, familiar to students in the German edition, is divided into three groups, designated respectively the "objective-systematic," the "epistemologico-biological," and "the philosophy of value."

In the first group Höffding places thinkers who set out with the special object of "elucidating the problem of existence." Wundt, Ardigò, Bradley, and Fouillée are given as representatives of this systematic tendency. The epistemologico-biological tendency is exemplified in the works of those who place the problem of knowledge first, as do Maxwell, Hertz, Ernest Mach, and Richard Avenarius. Under the heading of "the philosophy of value" the subjective philosophies of Guyau and Nietzsche associate on equal terms with the objective tendency of Eucken's thought and the psychologico-religious investigations of William James.

The arrangement of the lectures, the clear exposition of each philosopher's most important views, and the brevity of the summaries, make this little volume a valuable addition to Höffding's work as a historian of philosophy. As he acknowledges the incompleteness of his *History of Modern Philosophy*, which stops short with the year 1880, it might be expected that he would put forward this book as a third part of the *History;* but he regards it as an independent work, because it is more dominated by his personal convictions in its expositions and criticisms than was his historical work. There is no attempt to give an exhaustive account of any of the philosophers presented. Each study includes a brief biographical sketch, followed by a digest of the philosopher's contributions to modern thought. Critical comments accompany or follow all such digests and add much to the interest of the essays for the average student of philosophy. As an attempt to summarize in compact and readable form the achievements of thinkers whose work has become most widely known since 1880, the lectures are sure to be very useful in this English translation.

The second part of the book, devoted to the lectures on Bergson, is new, but